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DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Fang-shan Petroleum Refinery

Fang-shan, China

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IMAGERY ANALYSIS SERVICE

INSTALLATION OR ACTIVITY NAME		COUNTRY
Fang-shan Petroleum Refinery		CH
UTM COORDINATES	GEOGRAPHIC COORDINATES	
50SMV065001	39-43-40N 115-54-40E	25X1
MAP REFERENCE		
15th RTS. USATC, Series 200, Sheet M0382-5HL, 3rd ed, Jan 64, Scale 1:200,000 (SECRET/		25X1
LATEST IMAGERY USED	NEGATION DATE (If required)	
	9 December 1966	25X1

ABSTRACT

Fang-shan is a new large integrated refinery and chemical complex. It has completed refinery facilities capable of crude oil distillation, catalytic cracking, light-ends recovery, catalytic reforming, and probably polymerization. Additional units are under construction. Based on the identification of the completed refinery units, the products include straight-run, cracked, and blended gasolines with a wide variety of octane ratings, kerosene, diesel and fuel oils, and probably petrochemical feedstocks. Associated with the refinery are two storage and transshipment facilities, a storage area, a probable petrochemical facility, and a chemical plant.

Site preparation and construction of support buildings for the refinery began between December 1966 and May 1967. Construction proceeded slowly until early 1969. Construction was rapid between early 1969 and April 1970 and proceeded at an unprecedented pace between April and November 1970. During the latter period, new processing units were added to the refinery, the eastern storage and transshipment facility was expanded, new construction was under way at the probable petrochemical facility, and processing units were constructed at the chemical plant. In November, construction was continuing in the refinery and chemical complex.

The refinery was first seen in operation in October 1969 and has been operating on all subsequent coverage through November 1970.

This report includes a photograph of the refinery and its associated facilities, a line drawing of the refining area, a detailed listing of buildings and processing equipment in the refining areas which are completed, dimensions of storage tanks, and a discussion of the status of facilities.

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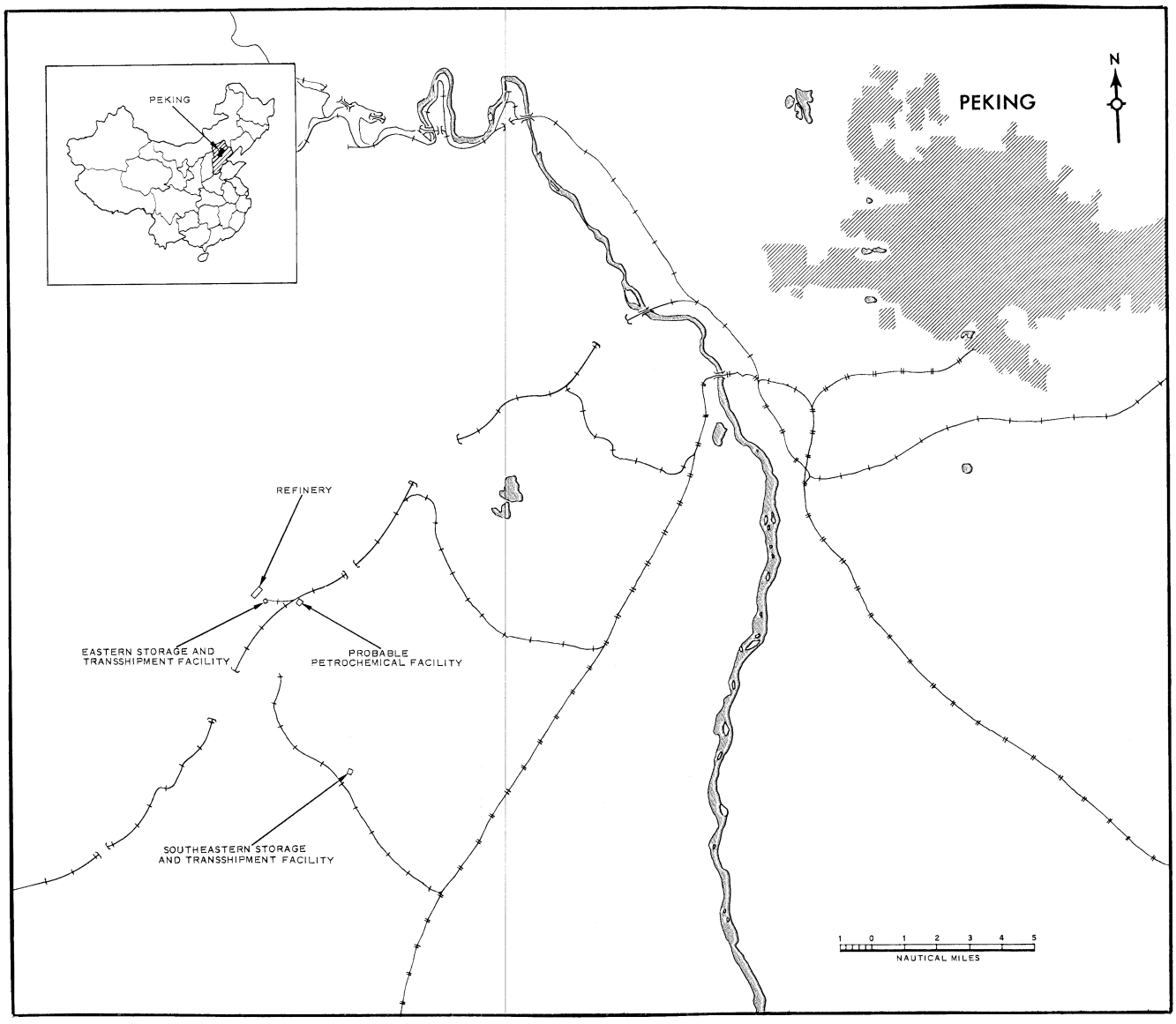

FIGURE 1. LOCATION MAP.

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INTRODUCTION

Fang-shan Petroleum Refinery is situated in the foothills of the Wu-tai Mountains, 24 nautical miles (nm) southwest of Pei-ching and 4 nm northwest of Fang-shan, in Pei-ching Shih (municipality) (see Figure 1). The refinery is probably charged with crude oil produced at the Ta-ku oil field and at the Kuang-jao oil field located 100 and 125 nm southeast of the refinery respectively.

The crude oil is probably brought by rail to a storage and transshipment facility 7.5 nm southeast of the refinery. The oil is then brought to the refinery by pipeline. A rail-served storage and transshipment facility in a valley just east of the refinery and a storage area located in the hills south of the refinery are connected to each other and to the refinery by pipeline. A probable petrochemical facility 1.3 nm east of the refinery is also connected to the refinery by pipeline. A chemical plant is under construction between the refinery and the storage area.

Electric power is received through a transformer substation collocated with the refinery.

BASIC DESCRIPTION

Physical Features

The refinery and chemical complex (excluding the probable petrochemical facility and the southeastern storage and transshipment facility) measures approximately 10,500 by 2,950 feet and occupies a 700-acre area (see Figure 2).

The refining area occupies 200 acres (see Figures 3 and 4). It has no visible security other than its remote location in the foothills of the Wu-tai Mountains.

Operational Functions

The units presently completed at the refinery accomplish crude oil distillation, catalytic cracking, light-ends recovery, catalytic reforming, and probably polymerization. Several additional secondary processing units are under construction. Based on the identification of the completed units, the refinery products include straight-run, cracked and blended gasolines with a wide range of octane ratings, kerosene, diesel and fuels oils, and probably petrochemical feedstocks. The products of the chemical plant and the probable petrochemical plant are not known at this time.

Construction and Operational Status

Construction of support facilities for the refinery began between December 1966 and May 1967. By June 1968, the refinery area had been graded, two excavations had been made for storage tanks, and site preparation was under way for a storage and transshipment facility east of the refinery. By November 1968, several storage tanks had been constructed at the refinery, and a storage area was under construction in the hills to the south.

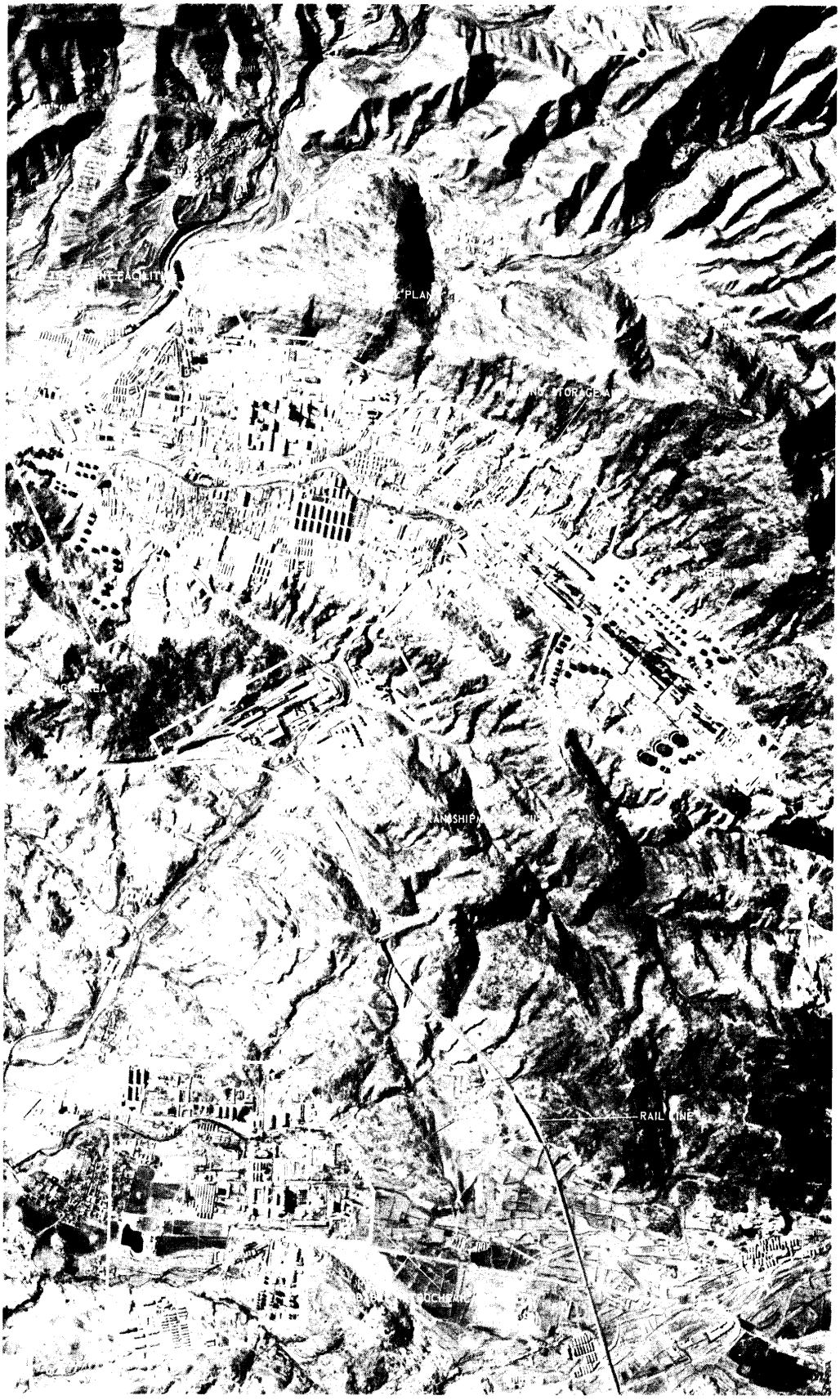

FIGURE 2. FANG-SHAN PETROLEUM REFINERY AND ASSOCIATED FACILITIES,

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By February 1969, a crude oil distillation unit, a catalytic reforming unit, a cooling tower, and a transformer yard were in the early stages of construction. Six excavations had been made for probable crude oil storage tanks at a storage and transshipment facility 7.5 nm southeast of the refinery (see Figure 5). Work was continuing on the eastern storage and transshipment facility and on the storage area.

After February 1969 the pace of construction became more rapid. By October 1969, the crude oil distillation unit, a catalytic cracking unit, a light-ends recovery unit, and a steam plant were complete and in operation. The catalytic reforming unit was almost complete. Two probable blending/treating units were in early stages of construction. Nearly all of the storage tanks were in place in the storage area. At the eastern storage and transshipment facility, several rail tracks and several support buildings were completed. At the southeastern storage and transshipment facility, six large storage tanks were complete except for earth covering. A probable petrochemical plant was in the midstage of construction.

By December 1969, the catalytic reforming unit, the southeastern storage and transshipment facility, and the probable petrochemical plant appeared complete.

By April 1970, the probable polymerization unit and the two probable blending/treating units were complete. Additional processing units were under construction at the north and south ends of the refinery. Site preparation had begun for the chemical plant. Several storage tanks and tank bases had been constructed behind the refinery cooling tower. One of two transformers was in place at the transformer substation. Tank farms were under construction on the north and west sides of the eastern storage and transshipment facility.

In October 1970, only the southeastern storage and transshipment facility was seen. The photography revealed tanks under construction in a small separately secured area next to the six large buried probable crude oil storage tanks. The tanks being constructed were small, indicating the storage area will be for finished products. A large railroad classification yard and probable tank car cleaning and repair facility had been constructed just south of this area.

Photography of November 1970 revealed extensive additional construction since April. At the refinery, one unidentified secondary processing unit was newly completed, several other units were in the midstage of construction, and the storage capacity had been significantly increased. In the eastern storage and transshipment facility, numerous small-diameter storage tanks and tank bases had been constructed. At the probable petrochemical facility, the original plant was being expanded and a new plant had been started which contained several buildings, storage tanks, and some processing equipment. A chemical plant was in the midstage of construction; several buildings had been built and processing equipment had been placed in three separate units. Additional storage tanks had been constructed throughout the complex.

Facilities and Equipment

Table 1 lists the functional areas and equipment within the refining area of the plant. In areas which are still under construction and whose function is undetermined, the buildings and processing equipment are not included in the table or shown in Figure 4. All measurements are rounded to the nearest 5 feet.

Table 1. Equipment and Facilities at Fang-shan Petroleum Refinery (Keyed to Figure 4)

Area	Functional Description	Equipment and Facilties
A	Storage	17 Support buildings 22 Cylindrical storage tanks 2 145-foot-diameter 1 140-foot-diameter 2 110-foot-diameter 4 75-foot-diameter 4 60-foot-diameter 1 50-foot-diameter 6 40-foot-diameter 2 30-foot-diameter 1 Tank base
B	Unidentified Secondary Processing	1 Unit with 11 columns 1 cluster of processing equipement 2 processing buildings 10 cylindrical storage tanks 3 25-foot-diameter 7 15-foot-diameter 8 Support buildings
C	Catalytic Reforming	1 Unit with 2 fractionating columns 2 reactors 2 clusters of processing equipment 2 banks of heat exchangers/cooling coils/accumulators 1 A-frame furnace 1 processing building 2 support buildings 3 horizontal storage tanks, 25 feet long
D	Light-Ends Recovery	1 Unit with 2 columns 1 bank of heat exchangers/ cooling coils/ accumulators 1 compressor building 1 support building 2 horizontal storage tanks, 35 feet long

Area	Functional Description	Equipment and Facilties
E	Probable Polymerization	1 Unit with 5 columns 1 cluster of processing equipment 1 processing building 2 cylindrical storage tanks, 10 feet in diameter 1 horizontal storage tank, 35 feet long
F	Fluid-Flow Catalytic Cracking	1 Unit with 1 reactor 1 regenerator 1 fractionator 1 rerun column 2 catalyst hoppers 1 cluster of processing equipment 1 large DeFlorez furnace 1 bank of heat exchangers/cooling coils/accumulators 1 processing building 2 support buildings
G	Crude Oil Distillation	1 Unit with 1 atmospheric column 1 vacuum column 3 other columns 1 cluster of processing equipment 1 bank of heat exchangers/ cooling coils/ accumulators 1 A-frame furnace 1 DeFlorez furnace 2 processing buildings 1 support building 1 treating/desalting section with 1 processing building 4 horizontal treating tanks 5 cylindrical storage tanks 1 15-foot-diameter 4 10-foot-diameter
H	Secondary Processing U/C	
I	Probable Blending/Treating	1 Unit with 10 blending/treating tanks 1 processing building 1 Unit with 4 blending/treating tanks 2 processing buildings 2 Support buildings 6 Cylindrical storage tanks 4 75-foot-diameter 2 30-foot-diameter

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Area	Functional Description	Equipment and Facilities
J	Water Cooling	1 32-cell cooling tower 1 Settling basin/spray pond 6 Support buildings
K	Storage	2 Support buildings 19 Cylindrical storage tanks 2 70-foot-diameter 14 60-foot-diameter 3 45-foot-diameter 8 Tank bases

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REFERENCES

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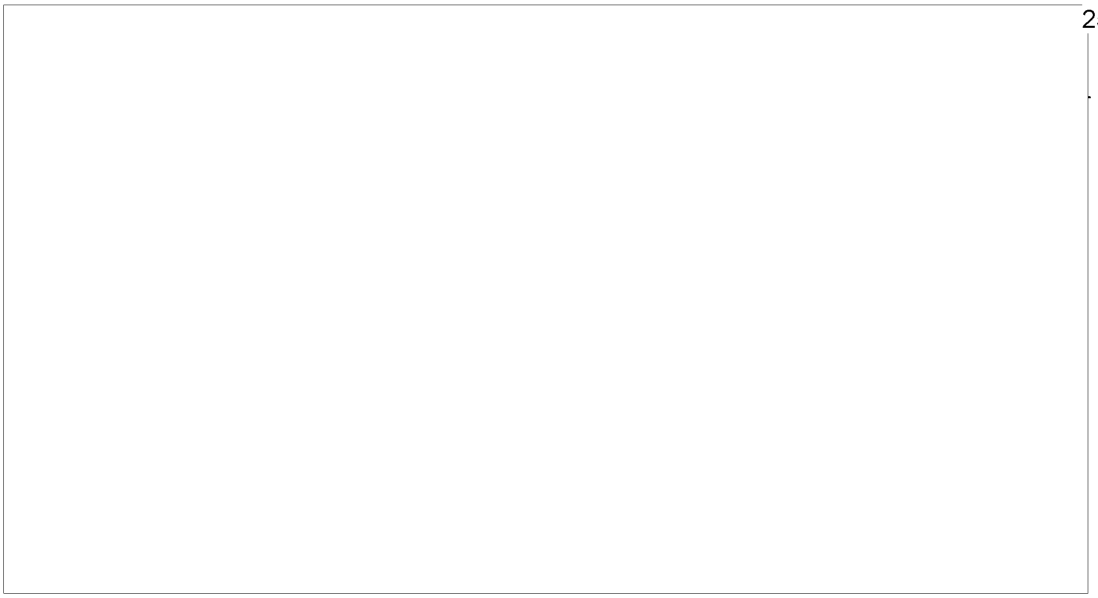

Map

15th RTS. US Air Target Chart, Series 200, Sheet M0382-5HL, 3rd edition, January 1964, Scale 1:200,000 (SECRET)

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Requirement

COMIREX NO2
Support Number 429247

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